REMARKS

Applicants respectfully traverse and request reconsideration.

Allowable Subject Matter

Claims 1-3, 7-12, 16 and 17 are currently pending. The Applicants wish to thank the Examiner for the allowance of claims 18 and 19 and for the notice that claims 4–6 and 13–15 would be allowable if rewritten in independent form, including all of the limitations of the base claim and any intervening claims. For the reasons discussed below, the Applicants respectfully request the rejection to the remaining claims be withdrawn.

Chang et al.

Chang et al. is directed to a computer graphics boundary-defined area clipping and extraneous edge deletion method. (Chang, title.) Chang, as cited, states that X-axis, Y-axis, and Z-axis clipped extraneous edges are each processed for removal differently. (Chang, ¶60–62.) In particular, X-axis and Y-axis extraneous edges are beneficially removed during the boundary definition stage of system area fill, while Z-axis extraneous edges are eliminated by processing inserted between the systems clipping and area fill stages. (Chang, ¶9, lines 62–66.) The filling phase of the pixel generation stage commences when the above-discussed end boundary definition command is encountered. (Chang, ¶10, lines 17–19.) Accordingly, as the boundaries are defined, Chang teaches filling the interior of the area defined by the boundary. Chang, in particular, teaches that the area fill hardware performs a two-mode operation: (1) boundary plot mode; and (2) scan mode. (Chang, ¶10, lines 50–60.) In the boundary plot mode, the closed boundary of the area is drawn and, in the scan mode, the interior of the area is filled. Id. Typically, the boundary and the interior of the line segment boundary-defined area have associated with them a boundary color and a different interior color, respectively. A real (i.e., non-clipped) edge is drawn in the boundary color and a clipped edge is drawn in the interior color during the filling stage. Id.

The fill control plane contains one pixel per scan line per vector, with the result that there are pairs of pixels (i.e., edge flags) per horizontal scan line for a given line segment boundary-defined area. (Chang, ¶10, line 68–¶10, line 2.) In the boundary plot mode of Chang, as cited, the area fill operation draws the edges of a clipped boundary-defined area to the bit planes, as well as to the screen refresh memory (SRM). (Chang, ¶10, lines 3–6.) Chang assumes horizontal line scanning during the area fill stage. (Chang, ¶11, lines 10–11.) Accordingly, Chang teaches performing the area fill stage operation when the boundary definition command is encountered and then, during the boundary plot mode of the invention, the area fill operation draws the edges of a clipped boundary-defined area to the bit planes. (Chang, ¶11, lines 3–5.) Therefore, in order to commence the area fill stage, when the boundary definition command is encountered, Chang describes filling the interior of the boundary-defined area and then drawing the edges of the clipped boundary-defined area. As a result, Chang teaches filling the entire area of the boundary-defined area and then clipping.

Z-axis extraneous edges must, therefore, be separately processed subsequent clipping, but before the area fill stage to remove any unwanted line segments. (Chang, ¶17, lines 31–34.) However, Applicants cannot find where Chang describes where the Z-axis extraneous edges appear outside of the two-dimensional X, Y plane defining the screen or window.

Nicholl et al.

Nicholl discloses polygon and polyline clipping for computer graphic displays. For a given polygon ($v_0, v_1, \ldots v_{n-1}$), [vertices of a polygon] and a point P=(xy) that is not on the boundary of the polygon or the window, sum the angle of v_0Pv_1, the angle of $v_1Pv_2, \ldots$,the angle of $v_{n-2}Pv_{n-1}$ in radiants. (Nicholl, ¶2, lines 35–38.) Dividing the sum by 2π yields a whole number, the wrap number of the point P. (Nicholl, ¶2, lines 38–39.) The clockwise direction is the positive direction, just like in mathematics. Id. A point on the boundary of the window or the polygon has no wrap number. All points in the window, but not the

window boundarym that have wrap numbers with respect to the original polygon should also has wrap numbers with respect to the resultant polygon. The wrap numbers of these points with respect to thc resultant polygon should be identical to the wrap numbers they have with respect to the original polygon. "This criterion prevents the modification of the topology of the part of the polygon that is in the window so that the filling process that might be used after the polygon clipping process can be done correctly." (Nicholl, ¶ 2, lines 59-62.)

Rejection of Claims under 35 U.S.C. § 102(b) based on Chang

Claims 1–3, 7–12 and 16–17 are rejected under 35 U.S.C. § 102(b) based on Chang, et al. (U.S. Patent No. 5,040,130) ("Chang".) A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single reference.[1] Furthermore, the identical invention must be shown in as complete detail as contained in the claim.[2] The elements must be arranged as required by the claim.[3]

Applicants submit that the Chang language cited by the Office Action regarding claim 1, which states that "Z-axis extraneous edges must, therefore, be separately processed subsequent clipping but before the area fill stage to remove any unwanted line segments" (Chang, ¶17, lines 31–33), is limited to processing Z-axis extraneous edges, rather than Applicants' claimed subject matter, including "filling only pixels in the portion of the primitive that is inside the screen region." As such, Applicants submit that the Chang language, as cited, neither discloses, teaches nor suggests Applicants' claimed subject matter.

The Office Action also cites to FIGS. 3, 7 and 10–12. For example, the specification describes reference numeral 40 of FIG. 3A as "pursuing a specific line segment boundary-

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[1] *Glaverzel Société Anonyme v. Northlake Marketing & Supply, Inc.*, 75 F.3d 1550, 1554 (Fed. Cir. 1999); *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 U.S.P.Q.2d 1051, 1953 (Fed. Cir. 1987.)

[2] *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 U.S.P.Q.2d 1913, 1920 (Fed. Cir. 1989.)

[3] *In re Bond*, 910 F.2d 831, 15 U.S.P.Q.2d 1566 (Fed. Cir. 1990.)

defined area clipping example, shown in FIG. 3A is a closed surface 40 of irregular shape, a portion of which is depicted to reside within a window or viewport 42." (Chang, ¶5, lines 27–30.) Therefore, since Chang defines the line segment boundary-defined area as the closed surface 40, as shown in FIG. 3A, then Chang refers to the line segment boundary-defined area as the portions that reside within the window and also without the window. As a result of defining the line segment boundary-defined area as including the area both inside and outside the window, the discussion of filling the area defined by the line segment boundary-defined area therefore includes filling both the areas defined within the window and outside of the window. Furthermore, the reference symbol 40 shown in FIG. 3A is clearly shown to refer to the portion of the line segment boundary-defined area that is outside of the window as described by Chang also indicating filling both areas inside and outside the window.

The Office Action cites to FIGS. 7A and 7B, wherein X-axis extraneous edge detection is depicted. (Chang, ¶13, lines 33–38.) Boundary-defined area 150 is clipped against the Xmin limiting plane of a clipping window 152 such that two discrete areas 151, shown shaded, remain viewable. Therefore, the boundary-defined areas 150 includes both areas within the window and without the window and, therefore, since the area fill stage occurs during the boundary definition stage, Chang teaches filling the entire boundary-defined area both inside the window and outside the window. The shaded portions of the boundary-defined area 151 shown in FIG. 7A and the shaded portion of the boundary-defined area shown in FIG. 3A clearly refer to the portion of the boundary-defined area within the window. Nowhere can the Applicants find where Chang, as cited, describes the shaded portions otherwise. Nowhere has the Office Action demonstrated that any of the cited figures are shown to describe how Chang teaches "filling only pixels in the portion of the primitive that is inside the screen region." The Office Action has merely mischaracterized Chang in an

effort to alter Chang in a way such that Chang would read on the claims. Further, Applicants submit that nowhere in the Office Action does the Examiner specifically point out what component of FIGS. 3, 7 or 10 through 12 is performing the function of "filling only pixels in the portion of the primitive that is inside the screen region." Because Applicants can find no language or any description in the figures in Chang that makes reference to "filling only pixels in the portion of the primitive that is inside the screen region," Applicants submit that Chang does not disclose, teach or suggest Applicants' claimed subject matter.

The Office Action asserts that the abstract of Chang also describes "filling only pixels in the portion of the primitive that is inside the screen region." Applicants submit that nowhere in the Office Action does the Examiner specifically point out where the abstract describes "filling only pixels in the portion of the primitive that is inside the screen region." Because the Applicants are unable to identify language in the abstract of Chang that describes "filling only pixels in the portion of the primitive that is inside the screen region," Applicants submit that Chang does not disclose, teach or suggest Applicants' claimed subject matter. As such, it is respectfully submitted that claims 1–3, 7–12 and 16–17 are allowable as written.

Applicants submit that the Chang language cited by the Office Action, which states "wherein said point pair processing occurs during the area fill processing of the graphics display system when said plane comprises an X-axis or Y-axis plane," is limited to describing point pair processing occurring during the area fill processing, rather than fill only pixels in the portion of the primitive that is inside the screen region. Chang neither discloses, teaches or suggests Applicants' claimed subject matter. Further, to the extent that Applicants fill only pixels in the portion of the primitive that is inside the screen region, Applicants' claimed subject matter is wholly different than that described in Chang, where Chang describes area fill processing while defining all edges in the boundary defined area. (Chang, ¶3, lines 14–27.)

Applicants submit that the Chang language cited by the Office Action regarding claim 1, which states that "in particular, X-axis and Y-axis extraneous edges are beneficially removed during the boundary-definition stage of the system area fill, while Z-axis extraneous edges are eliminated by processing inserted between the system's clipping and area fill stages," is limited to filling in the boundary-defined area as previously described during the boundary definition stage and also removing the extraneous edges in the X, Y plane (Chang, ¶9, lines 62–67), rather than Applicants' claimed subject matter including "filling only pixels in the portion of the primitive that is inside the screen region." As previously stated, Chang teaches filling in the area defined by the boundary definition stage while creating the boundaries. As such, Chang describes filling in portions of the pixel that are both inside and outside the screen region, as previously discussed. Furthermore, as previously discussed, the clipping of the Z-axis extraneous edges is not described with respect to clipping any edges outside of the screen region or window. As such, the cited portion of Chang at column 9, line 60, through column 10, line 18, does not describe "filling only pixels in the portion of the primitive that is inside the screen region." Similarly, the Office Action cites claim 12. However, claim 12 similarly describes the clipping plane comprising a Z-axis plane and, as such, does not describe filling the window within the X, Y plane since claim 12 is limited to clipping in the Z-axis plane.

Applicants submit that the Chang language cited by the Office Action (including claim 17 of Chang), which states "the boundary-defined area clipping and deletion method of claim 13 further comprising a sorting step prior to said processing step (H) for sorting said point pairs before the area filling process of the computer display system to eliminate any extraneous edge when the clipping plane comprises a Z-axis plane," is limited to a sorting step when the clipping plane comprises a Z-axis plane, rather than "filling only pixels in the portion of the primitive that is inside the screen region." Therefore, claim 17 and Chang

describes filling in the boundary-defined area, including the area both inside and outside the window according to a sorting step when the clipping plane comprises a Z-axis plane, and, as such, fails to describe "filling only pixels in the portion of the primitive that is inside the screen region." Applicants again reassert that the Office Action mischaracterizes Chang in a way to change Chang to read on the claims.

Claims 10–12 and 16–17

Applicants submit that Chang does not disclose, teach or suggest, either explicitly or implicitly, Applicants' claimed subject matter, *inter alia*, "an output for supplying filled pixels for pixels in the portion of the primitive inside of the screen region." Applicants respectfully reassert the arguments made above. Applicants further submit, argued in part at least immediately above, that claims 10, 11, 12, 16 and 17 are allowable in light of the presence of novel and non-obvious elements that are contained in these claims that are not otherwise present in claim 1.

Dependent Claims 3, 7 and 8

Applicants respectfully reassert the arguments made above regarding claim 1. Applicants submit that claims 3, 7 and 8 are allowable for at least the same reasons discussed above regarding claim 1. In addition, Applicants submit that because claims 3, 7 and 8 depend from claim 1 and, as dependent claims therefrom, claims 3, 7 and 8 are allowable for the reasons claim 1 is allowable. Applicants further submit that claims 3, 7 and 8 are also allowable in light of the presence of novel and non-obvious elements contained in claims 3, 7 and 8 that are not otherwise present in claim 1.

Rejection of Claims based on Nicholl

Claims 1-3, 7-12 and 16-17 are rejected under 102(b) based on Nicholl et al. U.S. Patent Number 5,455,897, "Nicholl." Regarding claims 1, 2 and 9, the Nicholl language cited by the Office Action, which states that "this criterion prevents the modification of the

topology of the part of the polygon that is in the window so that the filling process might be used after the polygon clipping process can be done correctly," Nicholl, ¶2, lines 59–62, is limited to preventing modification of the topology such that the wrap numbers of these points with respect to the resultant polygon should be identical to the wrap numbers they have with respect to the original polygon. (Nicholl, ¶2, lines 55–60.) The cited language of Nicholl, which states "this criterion prevents the modification of the topology of the part of the polygon that is in the window so that the filling process might be used after the polygon clipping process can be done correctly the modification of the topology of the part of the polygon that is in the window, rather than any discussion of a portion of the polygon that is outside of the window" (sic), cites to a sentence that is grammatically incorrect. This sentence appears to be limited to (1) processing a portion of the polygon that is inside the window rather than outside of the window, (2) meeting a wrap number criteria, and (3) the prevention of modification of the topology.

To the extent that Applicants are "filling only pixels in the portion of the primitive that is inside the screen region," Applicants' claimed subject matter is wholly different from that described in Nicholl, where Nicholl describes the filling process that might be used after the polygon clipping process can be done correctly, which similarly suggests that the filling process might be used before the polygon clipping process as well, which may refer also to edges that exist outside of the boundary lines. (Nicholl, ¶2, lines 13–15.) As such, Applicants submit that Nicholl neither discloses, teaches nor suggests, among other things, "filling only pixels in the portion of the primitive that is inside the screen region."

Claims 10, 11, 12, 16 and 17

Applicants respectfully reassert the arguments made above regarding claim 1. Applicants also submit that Nicholl does not disclose, teach or suggest, either explicitly or implicitly, Applicants' claimed, *inter alia*, "an output for supplying filled pixels for pixels for

portion of the primitive inside of the screen region." (Claim 10.) Applicants further submit, argued in part at least immediately above, that claims 10, 11, 12, 16 and 17 are also allowable in light of the presence of novel and non-obvious elements contained in claims 10, 11, 12, 16 and 17.

Dependent Claims 3, 7 and 8

Applicants respectfully reassert the arguments made above. The office action asserts that FIG. 1A, FIG. 2, and column 1 line 35 through column 3 line 31 describe "determining values of XSTART, YSTART, XEND, YEND FOR THE PRIMITIVE, XSTART and XEND defining an X where X is capitalized direction extent and location of the primitive in the coordinates system, and YSTART and YEND defining a Y direction extent and location of the primitive in the coordinate system." Applicants submit that nowhere in the Office Action does the Examiner specifically point out what component is performing the claimed invention *inter alia* determining values of XSTART, ... Because Applicant cannot find language in Nicholl that makes reference to each and every element of the claimed invention as arranged in the claim and, further, can also not identify *inter alia* language regarding an edge walker such that "edge walking the edge of the primitive from the start point to a boundary of the screen region," Applicants submit that Nicholl does not disclose, teach or suggest Applicants' claimed subject matter. As such, it is respectfully submitted that claims 3, 7 and 8 are allowable as written. Instead, Nicholl describes an approach that is wholly different from Applicants' claimed subject matter, since Nicholl describes satisfying criteria related to a wrap number such that wrap numbers, as previously described of these points with respect to the result in polygon, should be identical to the wrap numbers they have with respect to the original polygon. (Nicholl, ¶2, lines 56–59.)

CONCLUSION

Applicants respectfully submit that the claims are in condition for allowance and respectfully request that a timely Notice of Allowance be issued in this case. The Examiner is invited to contact the below-listed attorney at 312-609-7970 if the Examiner believes that a telephone conference will advance the prosecution of this application.

Respectfully submitted,

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